DOCUMENT RESUME

ED 285 655 PS 016 681

AUTHOR Amabile, Teresa M.; And Others
TITLE Immunizing Children against the Negative Effects of Reward.
PUB DATE Apr 87
NOTE 22p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (Baltimore, MD, April 23-26, 1987).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Attitude Change; Classroom Research; *Creativity; Elementary Education; *Elementary School Students; Grade 3; Grade 4; Grade 5; *Rewards; *Student Motivation
IDENTIFIERS *Intrinsic Motivation

ABSTRACT

To determine whether training could counter deleterious effects of reward on intrinsic motivation and creativity, 68 students in grades 3, 4, and 5 at a parochial school in Massachusetts were assigned to one of four conditions in which intrinsic motivation training and rewards were either provided or withheld. In the intrinsic motivation training condition, children met in small groups to view and discuss videotapes designed to help students focus on intrinsic reasons for working in school and to learn how to attain cognitive distance from socially imposed extrinsic constraints. Control group subjects viewed videotapes and discussed favorite topics. Subjects were then administered the Harter Scale of Intrinsic versus Extrinsic Orientation in the Classroom, and a reward manipulation was introduced in which children in the reward conditions were told they could use a camera if they told the experimenter a story. Significant differences were found between the scores on the Harter Curiosity Subscale for Children in the two training conditions, with subjects in the intrinsic motivation training condition scoring higher than subjects in the control condition. The reward contingency produced the predicted decrement in creativity for control group subjects. In contrast, rewarded students who received intrinsic motivation training told stories judged significantly more creative than those told by subjects receiving intrinsic motivation training and no reward. A 56-iterm reference list is included. (RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED285655

Immunizing Children Against the Negative Effects of Reward

Teresa M. Amabile

Brandeis University

Beth A. Hennessey

Wellesley College

Barbara S. Grossman

Brandeis University

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Beth A. Hennessey

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

PS 016681

For reprints, send request to Beth Hennessey, Dept. of Psychology, Wellesley College, Wellesley, MA 02181

Running head: TRAINING INTRINSIC MOTIVATION

BEST COPY AVAILABLE

As a group, social psychologists have been highly successful in demonstrating how to undermine intrinsic motivation. The first published investigations designed to consider this issue (Deci, 1971; Deci, 1972; Lepper, Greene & Nisbett, 1973) often involved a one-session procedure. Experimental subjects generally worked for one hour at a task such as the Soma or hidden-figures puzzles under some condition of reward, feedback, or constraint, whereas control subjects performed in the absence of such constraints. In order to obtain the dependent measure of intrinsic motivation, the experimenter then left the subject for a period of 8 to 10 minutes under some credible pretext, such as needing to use the computer or having to get additional evaluation forms. The experimenter's absence created the free-choice period in which subjects were alone and had no extrinsic reasons for working on the activity. Because subjects were unaware that they were being observed, and because they had a variety of interesting things to do, the time they spent with the target activity was used as the measure of their intrinsic motivation.

Employing this and similar paradigms, researchers have successfully demonstrated the overjustification effect: offering a reward for an enjoyable behavior can decrease the liklihood that that behavior will be performed under subsequent nonrewarded conditions. As explained by self-perception theory (Bem, 1972), subjects do not begin a task with a clear awareness of their own motivational orientation. As a result, those who perform an activity in the presence of some salient extrinsic contingency infer that their participation was motivated only by that constraint and not by their own interest. In other words, these subjects come to see themselves as extrinsically motivated. (For related explanations see also Deci, 1975; Deci & Ryan, 1980; Kelley, 1973.)

A number of investigations have been carried out to investigate this phenomenon. Monetary rewards have received the greatest amount of attention, and the results are clear. The experience of performing a task for money significantly decreases subjects' intrinsic motivation for that activity (Calder & Staw, 1975; Deci, 1972; Pinder, 1976; Pritchard, 1976). Yet, monetary payment is not the only type of reward that has been observed to have such deleterious effects. A wide variety of reward forms have now been tested, with everything from good-player awards to marshmallows producing the expected decrements in intrinsic motivation (Greene & Lepper, 1974; Kernoodle-Loveland & Olley, 1979; Harackiewicz, 1979; Ross, 1979). In fact, a situation devised by Lepper, Sagotsky, Dafoe and Greene (1982) demonstrates that one activity presented as a means to doing another activity will undermine subsequent intrinsic motivation, regardless of which activity was the means and which was the end. These researchers found that, regardless of the specific task used, intrinsic motivation was undermined for the task that had been presented as the means.

These studies and others like them illustrate how expected rewards can undermine subjects' motivation. The evidence is most convincing, even overwhelming. (For in-depth reviews of this literature see Bates, 1979; Condry, 1977; Deci & Ryan, 1980; Deci & Ryan, 1985; Kruglanski, 1978.) The fundamental question that has guided our own program of research is whether these same factors can also affect subjects' creativity. While relatively few other investigators have addressed this problem directly, there has been research on aspects of performance related to creativity.

Studies in this group have relied on a modified version of the standard overjustification paradigm (Deci, 1972) with one important distinction. Here, in addition to intrinsic motivation, qualitative aspects of subject performance are also assessed. In an investigation of the effect of reward on children's artistic creativity, Lepper, Greene and Nisbett (1973) found that, for preschoolers who initially displayed a high level of intrinsic interest in drawing with magic markers, working for an expected "Good Player Award"

decreased their interest in the task. When compared with an unexpected reward group and a control (no-reward) group, the subjects who had made their drawings in order to receive a good player award spent significantly less time using the markers during free-play periods, and this decrement in interest persisted for at least a week beyond the initial experimental session. Furthermore, the globally assessed "quality" (as rated by teachers) of drawings made by children expecting a reward was lower than that of the unexpected reward or control groups. Similar results have also been reported by Greene and Lepper (1974) and Kernoodle-Loveland and Olley (1979).

Employing a very different experimental task, Garbarino (1975) asked fifth- and sixth-grade girls to teach a matching task to girls in the first- and second-grade. The older children who served as teachers were either promised a reward (a free movie ticket) or were told nothing of reward. Two raters then observed the tutoring sessions and made independent assessments across an especially broad range of qualitative performance dimensions. These dependent variables included: the tutors' use of evaluation, hints, and demands; the learners' performance; the emotional tone of the interaction, including instances of laughter between the children during a session; and the efficiency of the tutoring (learning per unit of time spent).

Overall, rewarded tutors conducted sessions that were high-pressured and buisiness-like, while non-rewarded tutors held sessions that were relaxed yet highly efficient. The subjective ratings made by the two observers characterized the rewarded sessions as tense and hostile, and the nonrewarded sessions as warm and relaxed. In addition, the rewarded sessions were marked by more demands from the tutors, more negative evaluative statements by the tutors, less laughter, and poorer learning by the younger students.

Finally, Pittman and his colleagues (Pittman, Emery & Boggiano, 1982) found that nonrewarded subjects showed a strong subsequent preference for complex versions of a game, whereas rewarded subjects chose simpler versions. And Shapira (1976) reported that subjects expecting payment for success chose to work on relatively easy puzzles, whereas subjects expecting no payment preferred much more challenging ones. Each of these investigations points to the same conclusion: for subjects who initially display a high level of interest in a task, working for an expected reward decreases their motivation, undermines the globally assessed quality of their performance, and makes them much less likely to take risks or to approach a task with a playful/experimental attitude.

Creativity appears to result from just this sort of of risk-taking and uninhibited exploration (Amabile, 1983; Barron, 1968; Campbell, 1960; Crutchfield, 1962; Dansky & Silverman, 1975; Lieberman, 1965; Stein, 1974). For this reason, a number of recent studies have focused specifically on the effect of reward on creative aspects of subjects' performance. One of the earliest investigations of this type was conceived by Kruglanski et al. (1971). Israeli high school students who either had or had not been promised a reward (a tour of The Tel Aviv University psychology department) were given two open-ended creativity tasks. These tasks, adapted from Barron (1968), required subjects to list as many titles as possible for a literary paragraph, and to use as many words as possible from a 50-word list in writing their own story.

Originality ratings of these products were made by two independent judges with good interjudge reliability, and a clear and statistically significant superiority of nonrewarded subjects emerged. In addition, nearly significant differences were found between the two groups on two intrinsic measures: subjects' expressed enjoyment of the activities and their willingness to volunteer for further participation.

In one of our own investigations of the effect of reward (Amabile, Hennessey & Grossman, 1986, Study 1), children were given the opportunity to play with a

Polaroid camera before completing the target task. In other words, children assigned to the reward condition promised to do the target activity in order to first have a chance to use the camera. Children in the no-reward condition were simply allowed to use the camera and then presented with the target task; there was no contingency established between the two. Subjects' levels of intrinsic interest were assessed through self-report and behavioral observation during a free-play period.

In order to examine the impact of reward expectation on children's verbal creativity, the elementary school subjects in this study were asked to tell a story to acompany a set of illustrations in a book with no words. They did this by saying "one thing" about each page into a tape recorder. Like all the creativity tasks used in our research, this story-telling activity was specifically designed with two goals in mind. First, it was necessary that the importance of individual differences in domain-relevant skills be minimized since these could lead to high variability in baseline performance. In the storytelling task, for example, differences in children's verbal fluency were minimized by restricting their responses to one sentence per page. Second, in order to be appropriate for testing hypotheses about creativity, the task had to allow for a wide variety of responses. In other words, the target activity had to be an open-ended one (see Amabile, 1982b; McGraw, 1978).

At the beginning of the experimental session, children in grades 1 through 5 were given the opportunity to take two pictures with an instant camera. In order to first have a chance to use the camera, subjects in the reward condition promised to later tell the story. So that this contingency would be especially salient, children in this condition were asked to write their names on a piece of paper, a contract also signed by the experimenter. Subjects in the no-reward condition simply took the pictures and then told the story; there was no contingency established between the two tasks. In an application of the consensual creativity assessment technique (Amabile, 1982b), elementary school teachers familiar with children's writing later rated the stories for creativity, with a high level of interjudge reliability. Results indicated that, overall, children in the no-reward conditions told more creative stories than did children in the reward conditions. This main effect of reward was, in fact, statistically significant.

This study contributes significantly to our understanding of the undermining effect of reward. It is important that this undermining effect occurs even when nonrewarded subjects also experience the "reward" and even when the reward is delivered <u>before</u> the target activity. The only difference in the experiences of the rewarded and nonrewarded children in this paradigm was their <u>perception</u> of the reward as contingent or not contingent upon the target activity. It appears that the perception of a task as the means to an end is the crucial element for creativity decrements in task engagement.

Another of our investigations (Amabile, 1982a) also examined the effect of expected reward; but in this case the experimental task involved artistic creativity, and the reward was introduced in a competitive setting (incorporating an evaluative element). Girls whose ages ranged from 7 to 11 years made paper collages during one of two parties held in the common room of their apartment complex. Subjects in the experimental group competed for prizes, whereas those in the control group expected that the prizes would be raffled off. Artist-judges later rated each collage on creativity, with a high interjudge reliability. The control group was judged significantly higher than the experimental group on creativity of collages.

Taken together, these investigations lend strong support to what we have termed the intrinsic motivation principle of creativity: intrinsic motivation is conducive to creativity, whereas extrinsic motivation is detrimental (Amabile, 1983a). Like the early overjustification researchers, we have taken

what might be termed a negative approach. We have been successful in specifying conditions that will undermine subject intrinsic motivation; and in addition, we have found that reductions in intrinsic motivaton are accompanied by reductions in creativity of performance. Yet in our attempt to demonstrate a definitive link between creativity and intrinsic motivation, it is just as important to demonstrate that creativity will be maintained when intrinsic motivation is maintained as it is to demonstrate that creativity will be undermined when intrinsic motivation is undermined. Practically, when the areas of parenting and classroom instruction are considered, it is probably even more important to do so.

In a recent study, we adopted this more positivte approach as we set out to determine whether special training sessions designed to directly address motivational orientation could "immunize" children against the usually deleterious effects of reward on intrinsic motivation and creativity of performance. In this 2 X 2 (Intrinsic Motivation Training vs. Control X No Reward vs. Reward) factorial design, presentation of reward was completely crossed with type of training received. Only those subjects who had been specifically instructed in ways to overcome the usual deleterious effects of extrinsic constraints were expected to maintain an intrinsic motivational orientation in the face of expected reward and, as a consequence, it was predicted that they would evidence no reduction in creativity. Those assigned to the control condition who did not receive intrinsic motivation training were expected to experience the usual motivational decrements and lowered creativity of performance.

Method

Subjects. The subjects in this study were 68 students from Grades 3, 4, and 5 at a parochial school in eastern Massachusetts. Their ages ranged from 7 to 11 years. Students were individually asked to participate after consent was received from their parents. Subjects were randomly assigned to one of four conditions: intrinsic motivation training/reward, intrinsic motivation training/no reward, control/reward, control/no reward. All training periods were run by the same female experimenter. A second female experimenter conducted the creativity assessment sessions.

Procedure

Training sessions. In the crucial intrinsic motivation training condition, subjects were shown videotapes depicting two attractive 11-year-old children talking with an adult about various aspects of their schoolwork. The scripts for these tapes had been specifically designed so that the boy and girl on the tape would serve as models of highly intrinsically motivated individuals. There were two primary messages conveyed by these intrinsic-motivation training tapes. Our first goal was to get the children to focus on intrinsic reasons for doing work in school and to concentrate on those aspects for maximal enjoyment. The following is an example of a tape segment that addresses this issue:

> Adult: Tommy, of all the things your teacher gives you to do in school, think about the one thing you like to do best and tell me about it.
> Tommy: Well, I like social studies the best. I like learning about how other people live in different parts of the world. It's also fun because you get to do lots of projects and reports. I like doing projects because you can learn a lot

about something on your own. I work hard on my projects and when I come up with good ideas, I feel good. When you are working on something that you thought of, and that's interesting to you, it's more fun to do.

Adult: So, one of the reasons you like social studies so much is because you get to learn about things on your own. And it makes you feel good when you do things for yourself; it makes it more interesting. That's great!

The second issue addressed in the intrinsic-motivation training tapes was the practice of cognitively distancing oneself from socially-imposed extrinsic constraints - focusing instead on the inherently enjoyable aspects of a task in an effort to maintain intrinsic motivation in the face of such factors as reward or evaluation. An example:

Adult: It sounds like both of you do the work in school because you like it, but what about getting good grades from your teacher or presents from your parents for doing well. Do you think about those things?

Tommy: Well, I like to get good grades, and when I bring home a good report card, my parents always give me money. But that's not what's really important. I like to learn a lot. There are a lot of things that interest me, and I want to learn about them, so I work hard because I enjoy it.

Sarah: Sometimes when I know my teacher is going to give me a grade on something I am doing, I think about that. But then I remember that it's more important that I like what I'm doing, that I really enjoy it, and then I don't think about grades as much.

Adult: That's good. Both of you like to get good grades, but you both know that what's really important is how you feel about your work, and that you enjoy what you are doing.

In small groups of three to five members, subjects met with the experimenter for two 20-minute training periods on two consecutive days. Each intrinsic-motivation training session consisted of showing segments of the videotape, interspersed with directed discussion. During these discussions, the children were asked to relate what they had seen on the tape, to answer for themselves the questions the adult had posed, and to give their own reaction to the content of Tommy's and Sarah's responses. Throughout, the experimenter offered interpretations of the tape and the children's commentary, and shared her own ideas, all with the aim of making them more aware of intrinsic motivation and methods of coping with extrinsic constraints. At the close of each of these brief meetings, the children were asked to complete a series of short exercises in which they indicated their preference for a variety of school activities and described their feelings when performing their favorite tasks.

Subjects assigned to the control group also met in small groups over a 2 day period for the purpose of viewing videotapes. In this case, however, the discussion centered around their favorite things - foods, movies, animals, etc. The exercise sheets that followed also asked about favorite things such as musical groups and seasons of the year. In summary, then, all subjects participated in some form of group activity. All met with the experimenter,

saw videotapes, completed short written exercises, and participated in group discussions. What differentiated the conditions was the focus of these sessions: intrinsic motivation or issues irrelevant to intrinsic motivation.

Creativity tasks. After the training sessions had been completed, each child met individually with a different experimenter for testing. (The children's teachers and the experimenters were careful to avoid mentioning any connection between the training and testing sessions, and denied a connection if any of the children inquired.) The Harter Scale of Intrinsic vs. Extrinsic Orientation in the Classroom (Harter, 1981) was administered, and two dimensions of classroom motivation were assessed. These two dimensions, each having an intrinsic and an extrinsic pole, were: (1) Curiousity/Interest vs. Pleasing the Teacher/Getting Good Grades and (2) Independent Mastery vs. Dependence on the Teacher.

After this administration, a reward manipulation was introduced. Following a procedure used in an earlier study (Amabile, Hennessey & Grossman, 1986, Study 1), half of the children in each of the three training conditions were told that they could take two pictures with an instant camera only if they promised to later tell a story for the experimenter. In this way, the use of the camera was established as a task-contingent reward. In order to make this contingency especially salient, the experimenter had the children write OK and sign their name on a piece of paper that read, " I will tell the story if Barbara will let me take 2 pictures with camera." The experimenter also signed this agreement, and then it was placed at the corner of the testing table in full sight of the subject for the duration of the session.

For the remaining children, in the no-reward conditions, this picture-taking was presented simply as the first in a series of "things to do". Rather than have the children bring their pictures back to the classroom, the experimenter kept all photos in a large "School Pictures" album throughout the duration of the study. In this way, we controlled for children coming into the experiment with clear and salient expectations about the rewards they were to receive.

The major dependent measure, creativity on a storytelling activity, also paralleled that employed in a previous investigation (Amabile, Hennessey & Grossman, 1986, Study 1). In order to appropriately assess the effects of reward and previous training experience on creativity, it was necessary that this activity not depend on special skills that would increase the probability of large individual differences in baseline performance. In other words, every effort was made to choose a task that minimized variability in performance due to individual differences in skill, because this factor could mask experimental effects in this a study of social amd environmental influences on creativity (see Amabile, 1982a).

Children were asked to make up a brief story to accompany a fairly open-ended set of pictures in a book with no words. After looking through the illustrations once, subjects went through the book a second time saying "one thing" about each page. During the completion of this task, which was specifically designed not to depend heavily on verbal fluency, the experimenter sat with the child for the purpose of turning pages and operating a tape recorder. No comments or other attempts at interaction were made.

Results

Three elementary school teacher-judges rated each of the 68 stories on creativity. These subjective assessments of creativity were obtained following procedures outlined by Amabile (1982a). Reliability was high (.80), and a sum over all judges' ratings was computed for each product. There were no effects of children's age or sex on this creativity measure, and no interactions with the independent variables.

Story creativity means revealed that children exposed to intrinsic motivation training and offered a reward for their performance produced more creative stories than children in any of the other design groups, M = 55.33 (with the lovest possible score being 0 and the highest possible score being 60). Stories produced by subjects in the no-reward/intrinsic motivation training condition were judged to be the least creative, M = 32.30. Products produced by the reward/control and no-reward/control groups were intermediate: M = 38.19 and M = 47.59 respectively. A 2 X 2 (Reward X Training) analysis of variance (ANOVA) on the creativity ratings failed to reveal a significant effect for either training, $F(1, 64) = 0.939$, $p<.501$, or for reward, $F(1, 64) = 1.428$, $p<.236$. A significant Reward X Training interaction, hovever, was observed, $F(1, 64) = 7.379$, $p<.008$. By paired comparisons, the no-reward/intrinsic motivation group was judged significantly lover in creativity than the reward/intrinsic motivation group, $t(36) = 2.18$, $p<.036$, and the no-reward/intrinsic motivation group was judged significantly lover in creativity than the no-reward/control group, $t(36) = -2.05$, $p<.047$.

Differences were also found between the scores on the Harter Curiousity Scale for children in the two treatment conditions. Children receiving intrinsic motivation training scored higher than subjects in the control condition: M = 3.34 and M = 3.01 respectively.

Discussion

The results of our training study are at the same time extremely exciting and somewhat puzzling. How can ve explain the fact that those children who had received intrinsic-motivation training exhibited higher creativity when rewarded than when not rewarded? Perhaps the answer lies in their interpretation of the reward manipulation and story-telling activity. Perhaps our intrinsic-motivation training sessions had caused these young subjects to perceive their situation differently in some crucial way than did the control group.

This possibility is, in fact, not without both theoretical and empirical support. In their recent book Intrinsic Motivation and Self-determination in Human Behavior (1985), Edward Deci and Richard Ryan observe that previous research has tended to focus primarily upon the outvard experimental events themselves: the presence or absence of surveillance and the nature of the reward structure, for example, and their average effects on people's motivation and related variables such as creativity (p. 87). It is the belief of Deci and Ryan however, that the impact of an event on motivational processes is determined, not by the objective characteristics of the event, but rather by "its psychological meaning for the individual" (p. 85).

According to their cognitive evaluation theory, all external events can be vieved as either informational, controlling, or amotivating. An environmental event that is perceived as controlling is one that is interpreted by the perceiver as pressure to attain a given behavioral outcome - pressure that is interpreted to induce or coerce the recipient to perform in a specific manner. When this aspect is salient, the perception of an external locus of causality is facilitated, and intrinsic motivation tends to be undermined. An environmental event that is perceived as informational is one that provides the recipient with behaviorally relevant information in the absence of pressure to attain a particular outcome. A salient informational event increases intrinsic motivation if it signifies competence and decreases intrinsic motivation if it signifies incompetence. Finally, according to cognitive evaluation theory, it is also sometimes possible to classify some events as internally amotivating. These vould be events occuring within a person, such as self-deprecation or hopelessness, that signify his inability to master certain situations. Whether

an event will be perceived as informational, controlling, or amotivating, Deci and Ryan believe, is an issue of the relative salience of these three aspects for the perceiver, and is affected by his or her sensitivities and past experiences as well as by the actual configuration of the event itself (p. 85).

How might this analysis be applied to the specific case of our intrinsic-motivation training group? The message conveyed by our videotapes and guided discussions was that external rewards such as receiving good grades or money from parents were nice, but what was really important was that one truly enjoy what one is doing. In essence, what we had attempted, and evidently accomplished, was to develop a salient intrinsic orientation, or a more solidly internal locus of control, in our subjects. Thus, while the nontrained subjects perceived the reward manipulation as strongly controlling, the trained subjects most likely did not.

In our study, we attempted to <u>create</u> individual differences in motivational orientation between subjects. Other researchers have taken the route of examining differences that already exist. In one of the few investigations that have examined differences in the perceiver as a possible mediator of the effects of extrinsic constraints on intrinsic motivation, Lonky and Reihman (1980) studied the impact of verbal praise on the intrinsic motivation of children scoring high and low on internal locus of control. They found that when children high on internal locus of control were praised, they showed an increase in intrinsic motivation over pre-treatment assessments; but children scoring at the low end of the internal locus scale showed a decrease in intrinsic motivation levels after being praised. These authors conclude that persons high on internal locus of control believe themselves to be more in control of outcomes and are more likely to interpret rewards and communications as informational, whereas persons low on internal control will be more likely to interpret these same elements as controlling.

Another study with a focus on individual differences was carried out by Boggiano and Barrett (1984). In this investigation, the effects of positive and negative feedback on the intrinsic motivation and performance of children who differred in their initial motivational orientation were assessed. It was found that success feedback increased the intrinsic motivation of intrinsically oriented children, but not that of extrinsically oriented children. Negative feedback also was observed to significantly increase the motivation of the intrinsically oriented subjects. For this group, it was apparently viewed as a challenge. However, for the extrinsically oriented children, the same negative message seemed to represent evidence of their incompetence, decreasing their intrinsic motivation even further and creating feelings of amotivation and helplessness.

In summary, the research outlined above demonstrates that characteristics of the perceiver (or recipient) of an environmental constraint, such as reward, have a great deal to do with how that constraint is received and interpreted. As Deci and Ryan point out, most situations are ambiguous enough that the relative salience of informational, controlling, and amotivational aspects of a situation can be unique for each individual. The same event can be perceived very differently, depending upon the orientations of the persons involved. It would seem that, in our training study, the intrinsic-motivation training sessions sufficiently altered the children's perceptions of the reward manipulation so as to counteract the usual undermining effects on motivation and creativity. Rather than passively receive the parameters of the reward situation, these children seem to have actively constructed them. They seem to have tailored the environment to meet their needs. (Interestingly, this same ability to shape one's environment is something that Sternberg (1985) has linked to gifted individuals.)

What we are really addressing here are questions that go far beyond the

specific case of our intrinsic-motivation training sessions to the broader issue of individual differences in general. This is a relatively new area for our own (and others') theorizing and research on the link between environmental conditions, motivation, and creativity. Up until this point, we have been primarily concerned with global effects- with the general effects of extrinsic constraint on motivation and creativity across a variety of situations and subject populations. Ours has been a hydraulic model, not unlike that used by most early intrinsic motivation theorists (e.g., Lepper & Greene, 1978): intrinsic motivation is conducive to creativity, and extrinsic motivation is detrimental; as extrinsic constraints increase, intrinsic motivation and creativity must decrease. Yet, as our own research and that of others has begun to demonstrate, perhaps this formula does not accurately describe all situations. Perhaps, under certain circumstances or with certain individuals, intrinsic and extrinsic forces can combine in an additive fashion. Certainly, this appears to be what happened in the training study. Rather than detract from the children's performance, the offer of reward actually augmented the curiousity and the creativity of performance of the intrinsic-motivation group. Apart from the internal-external locus of control distinction and the related intrinsic-extrinsic orientation distinction, might there be other naturally occuring individual differences that would make some people less vulnerable to the negative effects of extrinsic constraint on their intrinsic motivation and creativity?

Our observations of and intervivs with people in the work place lead us to believe that this is so. In a recent interview study (Amabile & Gryskiewicz, in press), we discovered that Research and Development scientists working within the same laboratory sometimes percieved the same extrinsic constraints quite differently. There are two interesting subgroups in the sample, exemplifying opposite extremes around the usual "modal" response to constraints: those who feel constantly suppressed by the constraints in their environment, and those who have somehow managed to rise above these constraints (or at least manage to view them in a perspective that does not interfere with creative production). Although we do not have detailed individual-difference measures on these scientists, we can speculate on what might be the crucial distinguishing characteristics between these two types of workers.

One dimension that may be relevant is that of self-esteem. In fact, an examination of the literature reveals that this personality construct may play a significant role where intrinsic motivation and creativity are concerned. A study conducted by Deci, Nezlek and Sheinman (1981) revealed, for example, that children in public school classrooms run by teachers who were oriented toward supporting autonomy had higher self-esteem and more intrinsic motivation than children assigned to classrooms where teachers were oriented toward controlling behavior. Similar findings were also reported by Harter (1982). Ryan and Grolnick (1984) also found strong positive correlations between intrinsic motivation and self-esteem in children, while Deci and Ryan (1985) presented data indicating that "strong and stable self-esteem seems to emanate from a strong sense of self, which motivationally means intrinsic motivation and more integrated internalization of extrinsic motivation" (p. 142). The more internalized one's extrinsic motivation, the more it is likely to contribute to a sense of positive self-esteem.

The evidence does not stop here. As early as the 1950's, researchers were pointing to the tendency of creative individuals to display strong self-acceptance and positive self-evaluation behavior (e.g., Fromm, 1959; Guilford, 1950); while in a detailed treatise on the antecedents of self-esteem, Coopersmith (1967) observes:

> There thus appears to be an underlying similarity in the processes involved in creative innovation

> and social independence, with common traits and postures required for expression of both behaviors. The difference is one of product - literary, musical, artistic, theoretical products on the one hand, opinions on the other - rather than one of process. In both instances the individual must believe that his perceptions are meaningful and valid and be willing to rely upon his own interpretations. He must trust himself sufficiently that even when persons express opinions counter to his own he can proceed on the basis of his own perceptions and convictions. (p. 58)
>
> The importance of self-esteem for creative expression appears to be almost beyond disproof. Without a high regard for himself the individual who is working in the frontiers of his field cannot trust himself to discriminate between the trivial and the significant. Without trust in his own powers the person seeking improved solutions or alternative theories has no basis for distinguishing the significant and profound innovation from one that is merely different...An essential component of the creative process, whether it be analysis, synthesis, or the development of a new perspective or more comprehensive theory, is the conviction that one's judgment in interpreting the events is to be trusted. (p. 59)

Despite this conviction that self-esteem is an essential prerequisite for creative expression, Coopersmith could find no studies that directly investigated this relationship. Recognizing this gap in the literature, he set out on his own to test this hypothesis and administered three tests to a group of adolescents: Unusual Uses, Circles, and Draw a Person (Torrance, 1966). His results were especially revealing. Groups high in subjective self-esteem performed in the most creative fashion on all three batteries, while groups low in self-esteem were significantly less original and innovating. Coopersmith observed these differences across the variety of conceptual, linguistic, and artistic skills required in the several tasks and suggested that this consistency indicates that persons high in self-esteem are likely to be more assertive, independent, and creative than persons with lower self-esteem - the conclusion being that individuals with high self-esteem listen to themselves more and are far more likely to trust their own judgments and reactions (Coopersmith, 1967).

In a similar investigation conducted by Garwood (1964), these predicted relationships between personality factors and creativity were again examined - this time within a population of young scientists. Using the Self-Acceptance scale of the California Psychological Inventory (CPI) as an index of self-esteem, creative subjects were observed, as a group, to score significantly higher than their not-so-creative colleagues.

While both of these investigations are highly suggestive, they offer only observational evidence of the connection between creative expression and high levels of self-esteem. Equally essential to the support of this relationship is data of a more experimental nature. If it could be shown, for example, that interventions designed to increase subjects' creativity can also have a positive effect on their self-esteem, or that conditions affecting self-esteem

also affect creativity, our case would be strengthened considerably. Three recent studies accomplish this end.

The first (Stasinos, 1984) employed a Pretest-Posttest Control Group design. As a pretest, the verbal and figural subtests from the Torrance Tests of Creative Thinking (TTCT) (1968 revised) and two self-esteem instruments designed by Coopersmith (1967) were first administered to a group of 90 middle and upper school mentally handicapped Greek children. Subjects assigned to the treatment condition then received 16 weeks exposure to the Mark1, New Directions in Creativity (NDC) Program (see Renzulli, 1973). Subjects assigned to the control group classes continued regular activities during this time. At the end of this training period, the same examinations and instruments used in pretesting were again employed. Analyses of variance yielded the predicted results. As a result of their training, the experimental group scored significantly higher than did the control group on 5 of the 7 indices of creativity employed. In addition, the two groups differed greatly in terms of subjective self-esteem measures, with the experimental group attaining the higher score, probably as a result of the creativity training program.

Taking a very different approach, Brockner and Hulton (1978) also present strong evidence of a substantial link between creativity and high levels of self-esteem. Recognizing a suggestion in the literature that persons low in self-esteem (low SE's) are more self-conscious than high self-esteem persons (high SE's) (see Ickes, Wicklund & Ferris, 1973; Turner, Scheier, Carver & Ickes, 1978), they went on to predict that it is self-consciousness that can impair task performance. It was reasoned that if low SE's could be lead to focus their attention away from themselves and onto the task, performance would improve relative to high SE's. Subjects high and low in chronic self-esteem performed a concept formation task under three conditions: 1) in the presence of an audience, where self-focused attention is presumed to be high; 2) in a control group, in which attention was not manipulated; and 3) with instructions to concentrate diligently on the task itself. In this a 2 x 3 between-subjects factorial design, a significant effect was, in fact, obtained. Low SE's performed worse than high SE's in the audience condition, no differently in the control condition, and <u>better</u> than the high SE's when instructed to concentrate on the task. Brockner and Hulton conclude that the attentional state of low self-esteem persons makes them more susceptible or prone to be adversely affected by certain environmental factors. In the face of failure, for example, they suggest that persons with low self-esteem will become preoccupied with the self's deficiencies. In a related study, Cheek & Stahl (1986) found that the poetry-writing creativity of nonshy women was unaffected by expected external evaluation, but the creativity of shy women was significantly lower under evaluation than under nonevaluation conditions.

These results on the link between performance, environmental conditions, and self-esteem (or the related dimensions of self-consciousness and shyness) clearly suggest a mediation mechanism: environmental conditions such as expected evaluation can be perceived quite differently by persons who vary in self-esteem and, as a result, these environmental conditions can have quite disparate effects on the creativity of persons who differ along this dimension.

Beyond whatever might be said about self-esteem as a mediator between environment, motivation, and creativity, this line of inquiry suggests a new approach to creativity research in general. For most of the past four decades, creativity researchers have focused almost exclusively on individual differences - the qualities of talent, experience, and personality that distinguish highly creative persons from their less creative peers. Our own research, and that of a few colleagues, has taken the quite different approach of examining the influence of social/environmental factors on intrinsic

motivation and creativity. Both separate lines of inquiry have produced interesting and useful information; both have contributed to theory and practice. But, as is clear from our own recent research and the work on individual difference mediators of social effects, both lines of inquiry are incomplete.

There is no doubt that personal qualities of ability and personality have a great impact on creative behavior. There is no doubt that salient factors of extrinsic constraint in the social environment can have a consistently negative impact on the intrinsic motivation and creativity of most people most of the time. What we must now develop are research paradigms acknowledging that neither class of factors, by itself, can carry the day. Fluctuations in any individual's level of creative output must be examined in light of environmental influences on motivation, and environmental effects must be examined in light of individual person's <u>perceptions</u> of these influences. Only then can the "conditions of creativity" be understood as complex interactions between and among both internal <u>and</u> external conditions. We believe that this is the crucial next step.

References

Amabile, T. (1983a). The social psychology of creativity. New York: Springer-Verlag.

Amabile, T. (1983b). Social psychology of creativity: A componential conceptualization. Journal of Personality and Social Psychology, 45, 357-376.

Amabile, T. M. (1982a). Children's artistic creativity: Detrimental effects of competition in a field setting. Personality and Social Psychology Bulletin, 8, 573-578.

Amabile, T. M. (1982b). Social psychology of creativity: A consensual assessment technique. Journal of Personality and Social Psychology, 43, 997-1013.

Amabile, T. M., & Gryskiewicz, S. S. (in press). Creative environment and personality: Innovation in the R&D lab. In R. L. Kuhn (Ed.), Handbook for creative and innovative managers. New York: McGraw-Hill.

Amabile, T. M., Hennessey, B. A., & Grossman, B. S. (1986). Social influences on creativity: The effects of contracted-for reward. Journal of Personality and Social Psychology, 50, 14-23.

Barron, F. (1968). Creativity and personal freedom. New York: Van Nostrand.

Bates, J. (1979). Extrinsic reward and intrinsic

motivation: A review with implications for the classroom. Review of Educational Research, 49, 557-576.

Bem, D. (1972). Self-perception theory. In L. Berkovitz (Ed.), Advances in experimental social psychology (Vol. 6, pp. 1-62). New York: Academic.

Boggiano, A. K., & Barrett, M. (1984). Performance and motivational deficits of helplessness: The role of motivational orientations. Unpublished manuscript, University of Colorado.

Brockner, J., & Hulton, A. J. (1978). How to reverse the vicious cycle of low self-esteem: The importance of attentional focus. Journal of Experimental Social Psychology, 14, 564-578.

Calder, B., & Staw, B. (1975). Self-perception of intrinsic and extrinsic motivation. Journal of Personality and Social Psychology, 31, 599-605.

Campbell, D. (1960). Blind variation and selective retention in creative thought as in other knowledge processes. Psychological Review, 67, 380-400.

Cheek, J. M., & Stahl, S. S. (1986). Shyness and verbal creativity. Journal of Research in Personality, 20, 51-61.

Condry, J. (1977). Enemies of exploration: Self-initiated versus other-initiated learning.

Journal of Personality and Social Psychology, 35, 459-477.

Coopersmith, S. (1967). The antecedents of self-esteem. San Francisco: Freeman.

Crutchfield, R. (1962). Conformity and creative thinking. In H. Gruber, G. Terrell, & M. Wertheimer (Eds.), Contemporary approaches to creative thinking (pp. 120-143). New York: Atherton.

Dansky, J., & Silverman, I. (1975). Play: a general facilitator of fluency. Developmental Psychology, 11, 104.

Deci, E. (1971). Effects of externally mediated rewards on intrinsic motivation. Journal of Personality and Social Psychology, 22, 113-120.

Deci, E. (1972). Intrinsic motivation, extrinsic reinforcement, and inequity. Journal of Personality and Social Psychology, 22, 113-120.

Deci, E. (1975). Intrinsic Motivation. New York: Plenum.

Deci, E., Nezlek, J., & Sheinman, L. (1981). Characteristics of the rewarder and intrinsic motivation of the rewardee. Journal of Personality and Social Psychology, 40, 1-10.

Deci, E., & Ryan, R. (1980). The empirical exploration of intrinsic motivational processes. In L. Berkovitz (Ed.), Advances in experimental social psychology

(Vol. 13, pp. 1-55). New York: Academic.

Deci, E., & Ryan, R. (1985). Intrinsic motivation and self-determination in human behavior. New York: Plenum.

Fromm, E. (1959). The creative attitude. In H. H. Anderson (Ed.), Creativity and its cultivation. New York: Harper and Row.

Garbarino, J. (1975). The impact of anticipated reward upon cross-age tutoring. Journal of Personality and Social Psychology, 32, 421-428.

Garwood, D. (1964). Personality factors related to creativity in young scientists. Journal of Abnormal and Social Psychology, 68, 413-419.

Greene, D., & Lepper, M. (1974). Effects of extrinsic rewards on children's subsequent interest. Child Development, 45, 1141-1145.

Guilford, J. P. (1950). Creativity. American Psychologist, 5, 444-454.

Harackiewicz, J. (1979). The effects of reward contingency and performance feedback on intrinsic motivation. Journal of Personality and Social Psychology, 37, 1352-1363.

Harter, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom. Developmental Psychology, 17, 300-312.

Harter, S. (1982). The Perceived Competence Scale for Children. Child Development, 53, 87-97.

Ickes, W. J., Wicklund, R. A., & Ferris, C. B. (1973). Objective self-avareness and self-esteem. Journal of Experimental Social Psychology, 9, 202-219.

Kelley, H. (1973). The processes of causal attribution. American Psychologist, 28(107-128).

Kernoodle-Loveland, K., & Olley, J. (1979). The effect of external reward on interest and quality of task performance in children of high and low intrinsic motivation. Child Development], 50, 1207-1210.

Kruglanski, A. (1978). Endogenous attribution and intrinsic motivation. In M. Lepper, & D. Greene (Eds.), The hidden costs of reward. Hillsdale, NJ: Erlbaum.

Kruglanski, A., Friedman, I., & Zeevi, G. (1971). The effects of extrinsic incentive on some qualitative aspects of task performance. Journal of Personality, 39, 606-617.

Lepper, M., Greene, D., & Nisbett, R. (1973). Undermining children's intrinsic interest with extrinsic rewards: A test of the "overjustification" hypothesis. Journal of Personality and Social Psychology, 28, 129-137.

Lepper, M., Sagotsky, G., Dafoe, J., & Greene, D.

(1982). Consequences of superfluous social constraints: Effects on young children's social inferences and subsequent intrinsic interest. Journal of Personality and Social Psychology, 42, 51-65.

Lieberman, J. N. (1965). Playfulness and divergent thinking: An investigation of their relationship at the kindergarten level. Journal of Genetic Psychology, 107, 219-224.

Lonky, E., & Reihman, J. (September, 1980). Cognitive evaluation theory, locus of control, and positive verbal feedback. Paper presented at the meeting of the American Psychological Association. Montreal.

McGraw, K. (1978). The detrimental effects of reward on performance: A literature review and prediction model. In M. Lepper, & D. Greene (Eds.), The hidden costs of reward. Hillsdale, NJ: Erlbaum.

Pinder, C. C. (1976). Additivity versus non-additivity of intrinsic and extrinsic incentives: Implications for theory and practice. Journal of Applied Psychology, 61, 693-700.

Pittman, T. S., Emery, J., & Boggiano, A. K. (1982). Intrinsic and extrinsic motivational orientations: Reward-induced changes in preference for complexity. Journal of Personality and Social Psychology, 42, 789-797.

Pritchard, R. D., Campbell, K. M., & Campbell, D. J. (1977). Effects of extrinsic financial rewards on intrinsic motivation. Journal of Applied Psycholgoy, 62, 9-15.

Renzulli, J. S. (1973). New directions in creativity: Mark 1. New York: Harper and Rov.

Ross, M. (1975). Salience of reward and intrinsic motivation. Journal of Personality and Social Psychology, 32, 245-254.

Ryan, R. M., & Grolnick, W. S. (1984). Origins and pawns in the classroom: Self-report and projective assessments of individual differences in children's perceptions. Unpublished manuscript, University of Rochester.

Shapira, Z. (1976). Expectancy determinants of intrinsically motivated behavior. Journal of Personality and Social Psychology, 34, 1235-1244.

Stasinos, D. (1984). Enahancing the creative postential and self-esteem of mentally handicapped Greek children. Journal of Creative Behavior, 18, 117-132.

Stein, B. M. (1974). Stimulating creativity. New York: Academic.

Stein, B. M. (1975). Stimulating creativity. New York: Academic.

Sternberg, R. J. (1985). Cognitive development in the

gifted and talented. In F. D. Horowitz, & M. O'Brien (Eds.), The gifted and talented: A developmental perspective. Washington, DC: American Psychological Association.

Torrance, E. P. (1966). The Torrance tests of creative thinking: Norms-technical manual. Lexington, MA: Personnel Press.

Torrance, E. P. (1968). Torrance tests of creative thinking: Directions manual and scoring guide. Princeton, NJ: Personnel Press.

Turner, R. G., Scheier, M. F., Carver, C. S., & Ickes, W. J. (1978). Correlates of self-consciousness. Journal of Personality Assessment, 42, 285-289.